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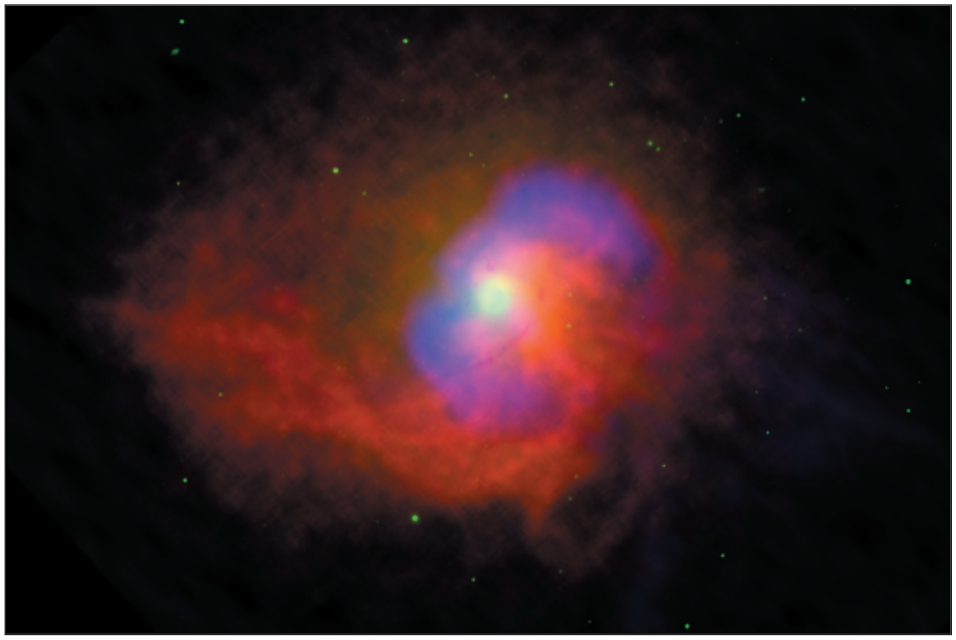
MARSHALL STAR

Serving the Marshall Space Flight Center Community **April 27, 2006**

Chandra finds black holes to be 'green'

From the Smithsonian Astrophysical Observatory

Black holes are the most fuel-efficient engines in the universe, according to a new study using NASA's Chandra X-ray Observatory, managed by the Marshall Center. By making the first direct estimate of how efficient or "green" black holes are, this work gives insight into how black holes generate energy and affect their environment.



X-ray: NASA/CXC/KIPAC/S.Allen et al; Radio: NRAO/VLA; Infrared: NASA/ESA/McMaster Univ./W.Harris

Using Chandra to study nine elliptical galaxies, scientists can estimate the rate at which gas is falling toward the galaxies' supermassive black holes.

The new Chandra finding shows most of the energy released by matter falling toward a supermassive black hole is in the form of high-energy jets traveling at near the speed of light away from the black hole. This is an important step in understanding how such jets can be launched from magnetized disks of gas near the black hole's event horizon, the distance from a black hole within which nothing, even light, can escape.

"Just as with cars, it's critical to know the fuel efficiency of black holes," said lead author Steve Allen of the Kavli Institute for Particle Astrophysics and Cosmology at Stanford University and the Stanford Linear Accelerator Center, Stanford, Calif. "Without this information, we cannot figure out what is going on under the hood, so to speak, or what the engine can do."

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Michoud open house highlights NASA Crew Launch Vehicle

Draws industry leaders and key stakeholders from Louisiana

By Sheri Bechtel

In New Orleans last week, NASA's Michoud Assembly Facility drew a packed house of industry leaders and key stakeholders from Louisiana eager to hear the latest about the facility's role in NASA's exploration mission and continuing development of the Crew Launch Vehicle.

Michoud, managed by the Marshall Center, hosted an open house Wednesday, April 19. More than 250 industry representatives from companies including Boeing, Lockheed and others attended the day-long event.

The event highlighted the value — to NASA, Louisiana and the nation — of the Michoud complex, where contractors manufacture, assemble and process the space shuttle external tank.

Topping the agenda was an update about progress of NASA's Constellation Systems Launch Vehicles Program, slated to build and fly vehicles that will lift future generations of explorers to the moon, Mars and beyond. Elements of the new launch systems will be manufactured and processed at the Michoud facility.

Among the NASA officials who spoke

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Michoud

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David Higginbotham/MSFC

At right, Marshall Center Director David King welcomes attendees at Michoud Assembly Facility in New Orleans. The space shuttle's external tank looms in the background. Below, Steve Cook, director of NASA's Constellation Systems Launch Vehicles Project Office at Marshall, speaks to industry leaders and stakeholders at the open house about America's new Crew Launch Vehicle at Michoud.

at the open house were Marshall Center Director David King and Patrick Scheuermann, chief operating officer of the Michoud facility. Both welcomed visitors and kicked off the day's activities with opening remarks. Presentations were held in the morning at the facility, followed by a tour of Michoud showcasing the facility's capabilities. Group break-out discussion sessions were held throughout the afternoon.

Mark Geyer, deputy manager of NASA's Constellation Program at Johnson Space Center in Houston, gave an overview of the program and its mission goals. Steve Cook, manager of the Constellation Systems Launch Vehicles Project Office at the Marshall Center, presented the architecture of NASA's new Crew Launch Vehicle, the flagship of America's next-generation space fleet. Danny Davis, manager of the Upper Stage Office in Marshall's Constellation Systems Launch Vehicles Project Office, spoke about the upper stage element of the Crew Launch Vehicle.

Michoud also welcomed Michael J. Olivier, secretary of economic development for Louisiana, who addressed attendees about partnerships and business opportunities with NASA and Michoud.

Other Marshall employees who participated in the open house included Jerry Cook, deputy manager of the Upper Stage Office; and Craig Seabrook, Marshall's business development director.

David Brock, lead small business specialist for the Marshall Center, spoke to attendees about subcontracting programs and other business opportunities with NASA and Marshall. He was supported by Helen Stinson, small business technical advisor, who spoke about small business innovation research contracts.

The writer, an ASRI employee, supports the Office of Strategic Analysis and Communications.

Marshall celebrates Earth Day with continuing commitment to environmental stewardship

By Jonathan Baggs

Marshall Center officials reaffirmed their commitment to environmental responsibility at the annual Earth Day celebration April 18 by pointing out how smarter building techniques are saving the agency money and helping renew natural resources.

Individuals and organizations also are expected to take responsibility for lessening environmental impacts of work performed at the center. This can be achieved by using recyclable materials and renewable energy in everything from building design to engineering new spacecraft, according to Robin Henderson, associate director of the Marshall Center and guest speaker Steve Sain, president of Sain Engineering Associates of Birmingham.

The theme of this year's event was "Renewable Energy: Good for the planet, better for you." Attended by hundreds of employees at Center Activities Building 4316, the event was sponsored by Marshall's Environmental Excellence Team.

Comprising volunteers from across the center, the team works under the guidance of the Environmental Engineering and Occupational Health Office, part of Marshall's Office of Center Operations.

Sain, a registered professional engineer in four states, has more than 25 years of experience in energy efficiency consulting. He noted that various forms of alternate energy are being studied, some of which already are in limited use. These energy solutions — from creating electricity using solar cells or wind turbines, to using ethanol or hydrogen for fuel — could help lessen dependence on fossil fuels.

Some of these energy solutions are being included in new buildings at the Marshall Center, such as the Engineering Building 4600 on Martin Road, which opened in November 2005. Named a "model for sustainable design" by the U.S. Department of Energy, the facility is one of only four federal buildings to be granted the 2005 Federal Energy Saver Showcase Designation Award.

The 139,000-square-foot building's east-west orientation and sun shades minimize sun exposure, while an open floor plan allows for an abundance of natural light. Energy-saving features include light sensors, photovoltaic roof panels and a reflective roof membrane that decreases solar heat transferred into the building to reduce air conditioning use.

Waste water is distributed to a retention pond for irrigation — saving 3.5 million gallons of potable water annually. More than 85 percent of construction waste was reused or recycled and 20 percent of the building's material is made of recycled content.

"We are very proud of this new building and how its sensitivity to the environment was built into the design," Henderson said. "Recycling and using renewable energy resources is a personal and professional responsibility. NASA works hard to find ways to better understand and help our planet."

The Earth Day event at Marshall included participation by about 30 vendors in Building 4316 offering giveaway items and

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Emmett Given/MSFC

Planting a flowering dogwood outside Building 4316 during Earth Day ceremonies April 18 are, from left, Sharon Scroggins, a Marshall lead environmental engineer; Madison mayor and retired Marshall employee Arthur S. "Sandy" Kirkindall; Robin Henderson, Marshall Center associate director; Jim Carter, Marshall's director of the Office of Center Operations; and guest speaker Steve Sain, president of Sain Engineering Associates of Birmingham.

Chandra

Continued from page 1

Allen and his team used Chandra to study nine supermassive black holes at the centers of elliptical galaxies. These black holes, from 0.2 to 3 billion times the mass of our sun, are relatively old and generate much less radiation than quasars, the rapidly growing supermassive black holes seen in the early universe.

"If a car was as fuel-efficient as these black holes, it could theoretically travel over a billion miles on a gallon of gas,"

— Christopher Reynolds, from the University of Maryland, College Park and the study's co-author

The surprise came when the Chandra results showed these "quiet" black holes are all producing much more energy in jets of high-energy particles than in visible light or X-rays. These jets create huge bubbles, or cavities, in the hot gas in the galaxies.

The efficiency of black hole energy production was calculated in two steps. First, Chandra images of the galaxies' inner regions were used to estimate how much fuel is available for the black hole. Then, Chandra images were used to estimate the power required to produce the cavities. The galaxies were found to produce a lot of jet power with a surprisingly small amount of fuel.

"If a car was as fuel-efficient as these black holes, it could theoretically travel over a billion miles on a gallon of gas," said co-author Christopher Reynolds of the University of Maryland, College Park.

The findings explain how black hole engines achieve this extreme efficiency. Some of the gas first attracted to the black holes may be blown away by the energetic activity before it gets too near the black hole, but a significant fraction must eventually approach the event horizon, where it is used with high efficiency to power the jets. The study also implies that matter flows toward the black holes at a steady rate for several million years.

"These black holes are very efficient, but it also takes a very long time to refuel them," Allen said.

This new study also shows the energy transferred to the hot gas by the jets should keep hot gas from cooling, thereby preventing billions of new stars from forming. This would place limits on the growth of the largest galaxies.

These results will appear in an upcoming issue of the "Monthly Notices" of the Royal Astronomical Society. The Marshall Center manages the Chandra program for NASA'S Science Mission Directorate.

The Smithsonian Astrophysical Observatory controls science and flight operations from the Chandra X-ray Center, Cambridge, Mass.

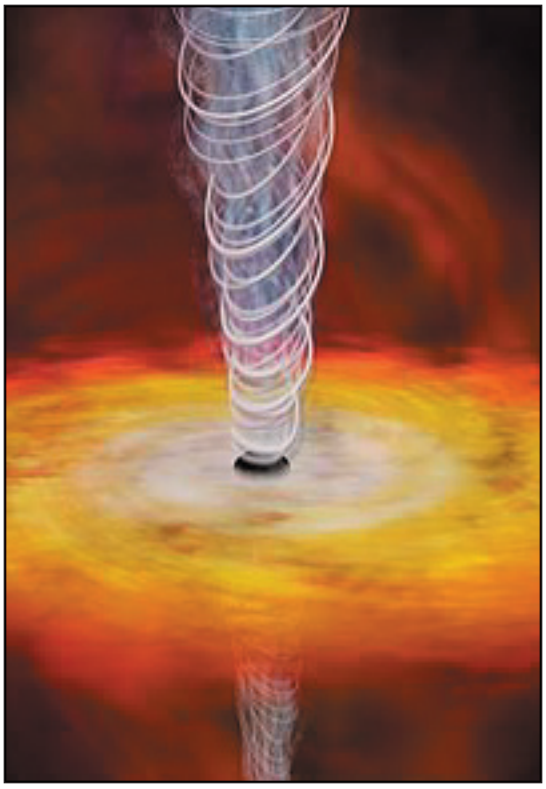
Chandra and black holes

A sample of previous Chandra discoveries

By Sherrie Super

- Jan. 14, 2000 — Chandra reveals a possible black hole in the Milky Way. Culminating 25 years of searching by astronomers, researchers say that a faint X-ray source, newly detected by Chandra, may be the long-sought X-ray emission from a known supermassive black hole at the center of our galaxy.
- Nov. 11, 2002 — Chandra makes first ID of a binary black hole. By revealing two active black holes in the nucleus of the extraordinarily bright galaxy NGC 6240, a Chandra image proves for the first time that two supermassive black holes can co-exist in the same galaxy.
- Sept. 9, 2003 — Chandra hears a black hole. Using the Chandra Observatory, astronomers for the first time detect sound waves from a supermassive black hole. Coming from a black hole 250 million light years from Earth, the "note" is the deepest ever detected from an object in the universe.

The writer, an ASRI employee, supports the Office of Strategic Analysis and Communications.



CXC/M. Weiss

An artist's illustration shows a close-up view of a supermassive black hole in a galaxy's center. Gas becomes hotter as it approaches the black hole, turning from red to yellow to white. Most of the gas is swallowed by the black hole, but some is launched in jets away from the black hole at almost the speed of light.

NASA Student Launch Initiative to be held May 4-6

High school teams to test rocket-building skills

By Bill Hubscher

Some of the best student rocket scientists from across the country will test their design skills by launching their own rockets at the NASA Student Launch Initiative May 4-6.

High school students from California, Colorado, Florida, Kentucky, Michigan, Virginia and Wisconsin will participate in the event, sponsored by the Marshall Center, the Huntsville office of Pratt & Whitney Rocketdyne Inc. and Aerojet of Sacramento, Calif.

The Student Launch Initiative allows high school and college student teams to put their aerospace and engineering knowledge to use in a real-world situation by designing and building their own rockets with a science payload.

Each team spent the 2005-2006 school year developing its vehicle, preparing and presenting formal reviews for panels of NASA engineers, developing Web sites showcasing their work, and testing systems associated with their rocket.

"This program encourages students to consider careers involving science and math," said Jim Ellis, manager of the Academic Affairs Office at Marshall. "By going through the building and launch process, including data retrieval and analysis, they're experiencing the practical applications of what they learn in school."

"We want to encourage this kind of project," Ellis said, "because these young men and women could very well be the next generation of explorers taking us back to the moon, to Mars and to destinations beyond."

The teams will demonstrate proof-of-concept during presentations to NASA engineers Thursday, May 4, proving their designs workable and showing that each reusable rocket will perform as intended.

The students have learned how to work on a budget for their project, and how to present financial proposals to NASA engineers and industry leaders.

A goal of the budgeting and rocket-building process of this educational program also is to help students gain problem-solving skills.

A special guest will join the student teams and Marshall Center engineers at the rocket exhibition May 4.

Astronaut Barry Wilmore, who accumulated more than 4,900 flight hours as a Navy pilot and joined NASA in 2000, will be on hand to talk about his experiences as a pilot and astronaut trainee. On Friday, May 5, the teams will tour the U.S. Space & Rocket Center.

The rocket launch will be Saturday, May 6, at the Mid Tenn. Turf Inc. sod farm near Manchester, Tenn. If the weather forecast calls for rain May 6, the launch will be in Tennessee on May 5.

The first team will launch its rocket at approximately 11 a.m. CDT. The event — free and open to the public — will continue until all teams have launched their rockets.

Each student team will launch its rocket, complete with scientific payload and altimeter, to ensure that it reaches the one-mile altitude requirement. Marshall Center engineers have evaluated teams on rocket design, including propulsion system, materials, payload and safety features.

Volunteers from the Huntsville Area Rocketry Association, a non-profit group of rocket enthusiasts, will assist students with flight hardware checks and assessment of flight altitudes.

High school teams participating for the first time in the Student Launch Initiative include those from Lakewood High School in Lakewood, Colo.; Plantation High School in Plantation, Fla.; Munfordville Elementary School in Munfordville, Ky.; Caro High School in Caro, Mich.; Southfield High School in Southfield, Mich.; and Madison West High School in Madison, Wis.

"We want to encourage this kind of project because these young men and women could very well be the next generation of explorers taking us back to the moon, to Mars and to destinations beyond."

— Jim Ellis, manager of the Academic Affairs Office at Marshall

In addition, several schools have returning teams from the 2004-2005 event, including Madison West; Laguna Creek High School in Elk Grove, Calif.; Edison High School in Fresno, Calif.; Oakton High School in Vienna, Va.; and University School of Milwaukee in Milwaukee, Wis.

Teams participating in the event for the first time were chosen from among schools that competed last May in the 2005 Team America Rocketry Challenge at Great Meadow in The Plains, Va.

The top 25 teams at the 2005 Challenge were invited to submit proposals to NASA to gain entry into the 2005-06 Student Launch Initiative.

Schools participating in the Student Launch Initiative for the first time receive a $2,500 grant.

The Student Launch Initiative is not a competition. NASA will recognize teams with plaques for excellence in various categories such as best vehicle design, payload and Web site development.

For more information on the Student Launch Initiative, visit http://education.msfc.nasa.gov/docs/127.htm .

The writer, an ASRI employee, supports the Office of Strategic Analysis and Communications.

Food is coming their way

Expedition 13 prepares for Progress visit

Expedition 13 Commander Pavel Vinogradov and flight engineer and NASA science officer Jeff Williams have prepared the International Space Station for two and a half tons of fresh food, supplies and equipment.

The 21st Progress to visit the space station launched from the Baikonur Cosmodrome in Kazakhstan at 11:03 p.m. CDT Monday, April 24. The new cargo craft was scheduled to dock with the station Wednesday afternoon, April 26.

Included in its 5,040 pounds of cargo will be more than 1,900 pounds of propellant, just over 100 pounds of air and oxygen, 661 pounds of water and almost 2,360 pounds of dry cargo. The Progress also brings some small crustaceans for a Russian scientific experiment called Aquarium. That experiment looks at stability of closed ecological systems in microgravity. It could provide information useful for lengthy human spaceflights.

Its sister cargo carrier and predecessor at the station, Progress 20, will be loaded with trash and surplus equipment until mid-June, then be deorbited and burn after entry into the Earth's atmosphere.

NASA

Newly arrived Expedition 13 Flight Engineer Jeff Williams checks out the Destiny laboratory of the International Space Station. The Marshall Center has a mockup of this laboratory in the center's Payload Operations Center.

Earth Day

Continued from page 3

information about how to treat the planet responsibly. Many offered information about how Marshall organizations can incorporate energy-saving techniques into their work operations.

Earth Day logo and photo contest winners were recognized for their entries supporting this year's theme.

Winners were:

- Logo — Jennifer Christopher, ODIN, supporting IS40 — Networks, Telecom & Desktop Services Office. To see the winning logo, go to http://eemo.msfc.nasa.gov/environmental/eday/ballot.asp .
- Color photo — Henry Faust, Baer Group, supporting IS60 — Integrated Enterprise Management Program Business Process & Application Office.
- Black and white photo — Gary Bean, SAIC, supporting CS40 — Performance and Capabilities Management Office. To see the winning photos, go to http://eemo.msfc.nasa.gov/environmental/eday/2006_photos.asp .

Sharon Scroggins, one of Marshall's lead environmental engineers in the Environmental Engineering and Occupational Health Office, said Marshall is NASA's Principal Center for Clean Air Act compliance.

The Marshall environmental office is responsible for documenting emerging regulations and assessing how they will impact programs across the agency, such as how next-generation spacecraft are designed and built, she said.

Events such as Earth Day help employees understand their personal responsibilities and those of their organizations toward environmental issues, Scroggins said.

"By coming together and promoting environmental awareness, we're sharing ideas regarding future challenges — not only in our individual lives, but in helping NASA solve challenges that will help us pioneer the future of space exploration."

The writer, an employee of ASRI, supports the Office of Strategic Analysis and Communications.

New Automated Awards System to be available June 2006

The Office of Human Capital announced plans to roll out the NASA Automated Awards System in June 2006. The Automated Awards System is one of the first systems to be developed and implemented under the Human Capital Information Environment, and will help the office comply with the e-Government initiative and the president's management agenda. The awards system will be used for all NASA and Marshall Center honor awards, performance awards and other incentive awards.

The awards system has been developed with the extensive involvement of an automated awards team comprising awards officers from each center. The team has helped ensure that the awards system maximizes the efficiencies of automation while preserving the traditional awards and award ceremonies that are unique to each center.

Awards will be among the first human resource processes to be administered by the new NASA Shared Services Center located at Stennis Space Center.

The Shared Services Center is an independent organization that will perform a variety of transactions and administrative activities currently being done at each center.

Using standard procedures and an agency-wide automated system will foster continuous improvement efforts, both at the Shared Services Center and at the field centers. More detailed information will be available in the future.

Technology Awareness Campaign to offer latest tools for Marshall

The Office of the Chief Information Officer is sponsoring a Technology Awareness Campaign from 10 a.m. to 3 p.m. Wednesday, May 3, in Center Activities Building 4316. An ice cream social will be at 1 p.m.

The latest products and services available to the Marshall work force will be displayed. These include items from high-end personal computers and mobile technology to the latest knowledge management applications, secure Web conferencing applications and collaborative tools for Web services. Information technology experts will be on hand to answer questions.

Burt Bright, IT Integration manager and Marshall's team lead for Desktop Services, said the products and services are meant to help users save time and offer better communication and powerful applications to manage tasks more efficiently. "With upcoming new projects like the Crew and Cargo Launch Vehicles, and Robotic Lunar Exploration, it is essential that the Marshall work force is aware of, and understands, the information technology available for its use through the Office of the Chief Information Officer."

Classified Ads

To submit a classified ad to the Marshall Star, go to Inside Marshall, to "Employee Resources," and click on "Employee Ads — Submit Ad." Ads are limited to 15 words, including contact numbers. No sales pitches. Deadline for the next issue is 4:30 p.m. Thursday.

Miscellaneous

Dog crate, large, 36"x24"x27", $50; electronic fence and collar, $45. 883-6496

Boys' Schwinn 16" Stingray bike, chopper, red, steel frame construction, cruising saddle. 256-655-2939

Trees in buckets for replanting, 4' Japanese Maple, $350, Dogwood, 2', $30. 880-9025

Wedding dress and veil, size 8, $100; computer desk w/ pedestal, shelves, $100. 776-9165

Desk w/ 3 drawers and bookcase top, $15; Two oak end tables, $15 each. 773-5051

2003 Epiphone Casino guitar, sunburst finish w/ hardshell case, $570. 684-0910

Murray push mower, 22" mulch/discharge, 4.5HP B&S, needs work, $25. 865-567-8862

Color laser printer, Konica-Minolta 2300W, new, never used, in factory sealed box, $250. 337-0075

HP Pavilion A340n desktop, 2.60GHz Pentium 4, 512MB, 120GB, CDRW/DVD, 17" monitor, speakers, $550. 652-0227

Heavy-duty Whirlpool washer and dryer, $200; Sigma guitar made by Martin, $200. 722-9989

Dell 8400 computer, 3GHz, new 19" LCD monitor, 1GB-RAM, new 128MB video, CD-RW/DVD, Windows XP, $680. 655-1986

Generator, Honda 2000Is, $800. 881-7000

Two Oak Express bookcases, light oak, 83-1/2"Hx33"W, six adjustable shelves, $75. 828-4817

Delphi SkyFi2 XM satellite radio receiver w/ home kit, car kit, remote and manuals, $120. 682-8795

DR trimmer/mower, 6HP, electric start, B&S engine, $375. 325-0085

Oak entertainment center for 36" TV, $500; two dining room sets; chandelier; glider rocker. 881-2131

Nordic Track recumbent stationary cycle w/magnetic resistance, various automatic resistance programs, $150. 479-8536

Camelot pool membership, including tennis courts, $375. 468-4796

Two aluminum storm doors, 32" wide, $35 for both. 852-2438 after 4 p.m.

Bicycle fork rack for truck bed, holds two bikes, $40. 864-8183

Sideboard/huntboard, cherry, Hepplewhite by Statton of Maryland, $900. 882-1097

Oak entertainment center, holds up to 36" TV, matching component pier, modern, $800. 829-0285

Refrigerator, white, $100. 233-0705 6-9 p.m. or weekends

BladeZ ION 450 electric scooter with seat package, 2 wheel, $200. 883-1667 evenings

Pfaltzqraff Bouquet pattern dishes, light blue, 14 place settings, many serving pieces and extras. 895-0988

Tennis racquet, New Head Liquidmetal Radical, 4-3/8 grip, 107 square inches headsize, $95. 883-1468

Workout equipment: decline bench, adjustable weight bench, free weights/tree, various bars, dumbbells, $400. 931-937-7830

Dell all-in-one printer. No ink cartridges, $30. 837-6776

Vehicles

Boat, 17' Silverline, 115 Mercury, live wells, trolling motor, depth finder, many extras, $1,550. 426-0223

1995 Cadillac Concours Deville, black, loaded, $3,000; 1994 Cougar, AT/AC, 102K miles, $2,000. 256-520-2802

1992 Ford F150, 6 cyl., LWB, w/ camper shell, $2,750; 1998 Coachman Catalina, 32', w/ 2 slide-outs, $13,000. 434-6004

1989 Wellcraft Bowrider boat, 5.7/V8, with Volvo Penta outdrive, $6,950. 256-656-2139

1999 Chevy Silverado, 144K miles, PW/PDL/PS, a/c, CD, dual exhaust, sliding rear window, $7,500. 566-1917

2003 Ford F150 Lariat truck, 4 door, power sunroof, many options, 48K miles, $18,900. 256-318-5372

2004 Nissan Altima 2.5S, white, 49K miles, $15,500. 256-347-4804

2000 Chevy Z71 extended cab, 151K miles, $12,000; 1994 Jeep Sahara, $5,900. 755-6022

2000 Corvette, Magnetic Red w/ tan interior, 6 speed, loaded, both tops, 46K miles, good tires, $24,500. 232-0246

2001 Toyota Tacoma Xtra-cab PreRunner, red, 74K miles, warranty, V6/AT, SR5 trim, toolbox, $15,500. 683-9016

2000 Blazer ZR2, 4x4, 2-door, black, CD/cassette, cruise, keyless, hitch, 119K miles, $5,300. 694-1121

2004 Massey Ferguson GC2300 compact tractor, 5' mid-mount mower, 100 hours, $8,000. 325-1961

2001 Ford Expedition XLT, 2WD, leather, 91K miles, $10,000. 256-656-4366

1999 Javelin Bass boat, 1999 Evinrude 175HP motor, TM/DF, hydraulic steering, $11,500. 837-4136

2003 Mitsubishi Lacer, 45K miles, auto, CD/AC, power windows, keyless entry, remote start, warranty, $9,000. 489-3120

1985 Honda XR250R 4-stroke dirt bike, new seals/gaskets, $600. 931-937-7830 after 5 p.m.

Villian II ski boat, new motor, $3,000. 679-0073

Wanted

Infant/newborn items. 256-656-2965

Free

Yamaha E-70 organ, currently not working. 851-8384

Two tickets to Tennessee Renaissance Festival, off I-840 SE of Nashville, May 6 or 7. 880-6146

Fire wood, split. 722-2821

STS-121 one step closer: external tank-solid rocket booster 'mate'

NASA's Kennedy Space Center, Fla.

Work got under way at NASA's Kennedy Space Center, Fla., Monday, April 24, to "mate," or attach, the space shuttle twin solid rocket boosters and the modified external fuel tank ET-119 — part of the shuttle stack for orbiter Discovery's STS-121 mission.

The tank, left, is lowered into position by a giant crane, and will be joined to the already assembled, or "stacked" boosters in the 52-story Vehicle Assembly building. Discovery's mission to the International Space Station has a launch planning window of July 1-19.

Marshall Association luncheon meeting to be held May 2

The Marshall Association will hold its next luncheon meeting Tuesday, May 2, at 11:30 a.m. in Building 4203, Conference Room 1201. The guest speaker will be Marty Kress, executive director of the National Space Science and Technology Center.

Created by the State of Alabama University System and the Marshall Center, the NSSTC is composed of 400 university, government and contractor researchers and 32 labs, housed in a 250,000-square-foot research lab.

Kress oversees a broad portfolio of projects that encompass earth and space science, instrument and sensor development for space science flight programs, advanced propulsion, thin disk lasers and microsatellites.

Kress will share his vision for the NSSTC, and discuss his current efforts in devloping a multi-agency research organization that is better aligned to meet the needs of NASA and the Department of Defense. In addition, he will share the lessons in leadership he has learned in managing NASA programs and organizations.

The charge for the luncheon is $11 for Marshall Association members and $13 for nonmembers. The cost is payable at the door, but employees must contact Sharal Huegele at sharal.b.huegele@nasa.gov or 544-728 by noon on Friday, April 28.

Attendees can join the Marshall Association by paying the $25 membership fee at the door. The money goes directly into the fund that finances scholarships awarded by the association each year.

MARSHALL STAR

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